

CLAIMS

1. Method for deadlock free altering of a network routing from a first routing function R_{old} , defining an established connection between a plurality of communication input ports I_1, \dots, I_n and output ports O_1, \dots, O_m , in a network element, to a second routing function R_{new} , defining a new connection between the said input and output ports, for execution by the network element for transmitting and receiving data packets, said method comprising:
 - (1) for each input port I_i , performing the following steps:
 - (1a) applying the first routing function R_{old} for the input port,
 - (1b) receiving a token on an input port I_i ,
 - (1c) applying the second routing function R_{new} for the input port I_i ,
 - (1d) forwarding data packets to every output port O_j associated with the input port I_i according to the second routing function R_{new} , provided that the output port O_j has transmitted the token,
 - (2) for each output port O_j , performing the following steps:
 - (2a) determining if the token has been received on all input ports associated with the output port O_j according to the first routing function R_{old} ,
 - (2b) transmitting the token on the output port O_j when the token has been received on all said input ports.
2. Method according to claim 1, wherein the network element is a switch.
3. Method according to claim 1 or 2, wherein the token is included in a data packet.
4. Method according to one of the claims 1-3, wherein the method is applied to deterministic routing functions.
- 30 5. Method according to one of the claims 1-4, wherein the method is applied to adaptive routing functions.
6. Method according to one of the claims 1-5, wherein the method is applied to source routing.
- 35 7. Method according to claim 5, wherein if the adaptive method gives rise to a cyclic dependency graph, the graph is pruned into a non-cyclic one before the

method is applied.

8. Method according to one of the claims 1-7, wherein the method is applied to only parts of a complete network.

5

9. Network element, comprising
a plurality of output ports for transmitting data packets to other network elements in
a network,
a plurality of input ports for receiving data packets from other network elements in
10 the network,
a processing device,
a memory,
characterized in that the processing device is arranged to perform a method
according to one of the claims 1-8.

15

10. Network element according to claim 9, wherein said routing functions are
implemented as tables stored in said memory.

11. Network element according to one of the claims 9 or 10, wherein said
20 memory comprises computer program instructions arranged to perform said method
when executed by said processing device.

25

12. Computer network system, comprising a number of network elements
according to claim 9.

30

13. Computer program, embodied on a storage medium or in a memory, or
carried by a propagated signal, for execution by a processing device in a network
element,
characterized in that the program comprises a set of instructions arranged to
perform a method according to one of the claims 1-8 when executed by the
processing device in the network element.